# THE STATUS OF SHRIMP (Penaeus monodon) AND PRAWN (Macrobrachium vollenhovenii) FARMING IN CROSS RIVER STATE, NIGERIA.

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## ABSTRACT

*A survey on the status of shrimp and prawn farming in Cross river state was carried out in March, 2011. The survey was conducted using structured questionnaires and visits to potential sites. Data obtained through the analysis of the questionnaires indicated that seventy seven percent (77%) of the respondents were within the age bracket of 21-50 years which fell within the active age while ten percent (10%) of the respondents were above 60 years. The educational background of the respondents showed that forty percent 40% had tertiary education, 5.7% had technical education, 28.5% secondary education and 11.4% had primary education. The survey revealed that there was no shrimp or prawn farming in the state at the time of visit. Majority of the shrimp production activities were mainly from the capture fisheries, including both artisanal and industrial fisheries. A number of fisher folk interviewed were very enthusiastic to venture into shrimp and prawn farming if the technology for the propagation of the species were made available to them. Successful development of shrimp/prawn culture technology and dissemination will enhance aquaculture production of the species thereby creating employment opportunities and alleviating poverty.*

***Key words:*** *Status, Shrimp, Prawn, culture, Cross river state.*

## NTRODUTION

Prawns and shrimps belong to the super phylum Arthropoda and the phylum crustacean. Their fisheries form a major industry in the Niger delta. It is the industry that supports the local populace. Most people are involved in the fishery all year round irrespective of age and sex (Abowei et.al 2009).The cultivation of shrimp in certain parts of the world has made shrimp farming an important global aquaculture sector (Yakubu and Onunkwo, 2006). Ogbonna (2001), reported an annual catch of 12,000 metric tons of shrimp in Nigeria between 1992-1997 despite the maximum sustainable yield (MSY) of 3,500-4,000 metric tons.

Penaeid shrimps are the leading cultured species but the culture of fresh water prawns had developed tremendously in the Asian countries such as Taiwan, Thailand, Vietnam and China (Ayoola et.al 2009).The Macrobrachium fishery is one of the specialized artisanal shrimp fisheries in the mangrove creeks, estuaries and coastal lagoons of Nigeria. In the Lagos lagoon, *Macrobrachium macrobrachium* Constitute 60% of all prawn landings, and up to 83% of all *Macrobrachium* fishery catches during the rainy season (Marioghae 1982, 1987). In the Niger delta, it is more commercially important to the artisanal catch in the tidal areas than *Macrobrachium vollenhovenii* a related shrimp specie (Powell, 1982).

Moses (1980), reported Artisanal shrimp catches in Akwa Ibom and Cross river states (Bordering the Cross river estuary) have been estimated to be 20,000 metric tons wet weight in 1997.

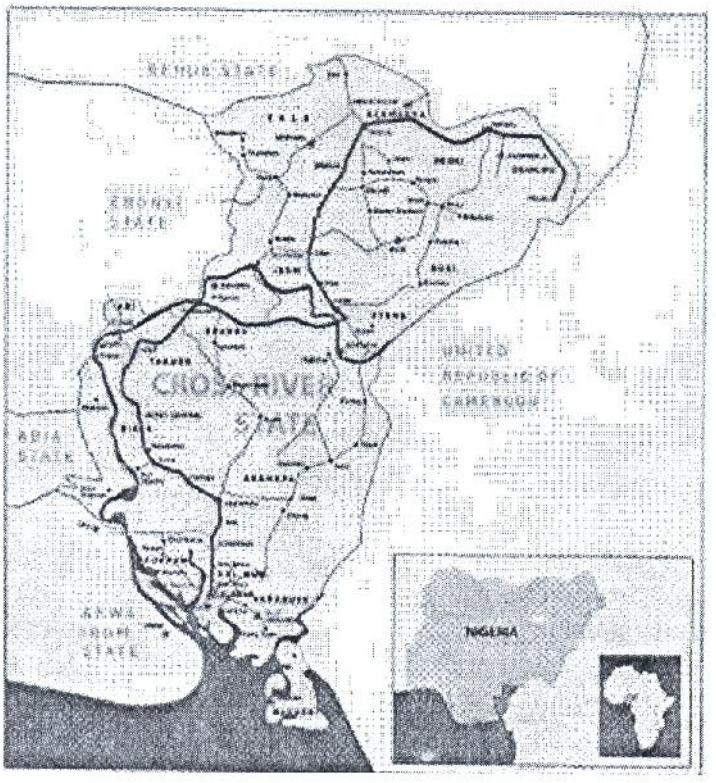
In Nigeria as a whole and Cross river state in particular, the bulk of shrimp/prawn activities are capture based. This has formed the bulk of the trading platform among local and international trading partners. The aquaculture potential of this enterprise is still in its infancy although pockets of attempts have been

made in recent past. This activity has been carried out at a subsistence level until recently that a hatchery for the propagation of *Penaeus monodon* and a trial process for *Macrobrachium* vollenhovenii have been initiated at the Nigerian institute for oceanography and marine research Lagos (NIOMR). At the time of this survey there was no record of shrimp/ prawn farming in the state. The survey was undertaken to assess the present status of shrimp/ prawn farming in Cross river state, identify existing shrimp and prawn farms, culture potentials and its impact on the economy.

## MATERIALS AND METHOD

### STUDY AREA

Cross River State is located in the south- south geo-political zone of Nigeria with its capital as Calabar. It is bounded on the east by Cameroon, West by Ebonyi & partly Abia State, in the north by Benue and south by Akwa Ibom and the Gulf of Guinea.




The state is a maritime State with a land mass of 23,074km$^2$. The state is covered by water from the tributaries of the Cross river and the Atlantic Ocean. It has one of the largest lakes in south-south Nigeria called the Reforme lake, home to a fishing festival held between march and may every year. Also two thirds of Cross River State is covered by the second largest reserved tropical rain forest and hence the state has one of the worlds biodiversity hot spots. The mineral resources include oil and gas, clay, salt, limestone, kaolin, barite and quartzite are the resources abound in Cross river state.
The state has 18 local government areas namely: Abi, Akamkpa, Akpabuyo, Bakassi, Bekwara, Biase, Boki, Calabar municipality, Calabar south, Etung, Ikom, Obanliku, Obubra, Obudu, Odukpani, Ogoja, Yakurr and Yalla. The state has a population of 2.89million people (2006) with main economic activities as transportation, subsistence agriculture, urban commerce and tourism. Major language spoken is Efik while other languages spoken are Ekoi, Boki and Becheve.

### SURVEY VISITS & ADMINISTRATION OF QUESTIONNAIRES

Global positioning system (GPS) was used to geo-reference sites where data were collected. Stratified Random sampling technique (Fig. 1) was employed in the administration of the structured questionnaires. A total number of seventy (70) questionnaires were administered in a manner

synonymous with the heterogeneous nature of the respondents. Researchers from NIOMR and other personnel from the State Department of Fisheries and ADP administered the questionnaires to the respondents.

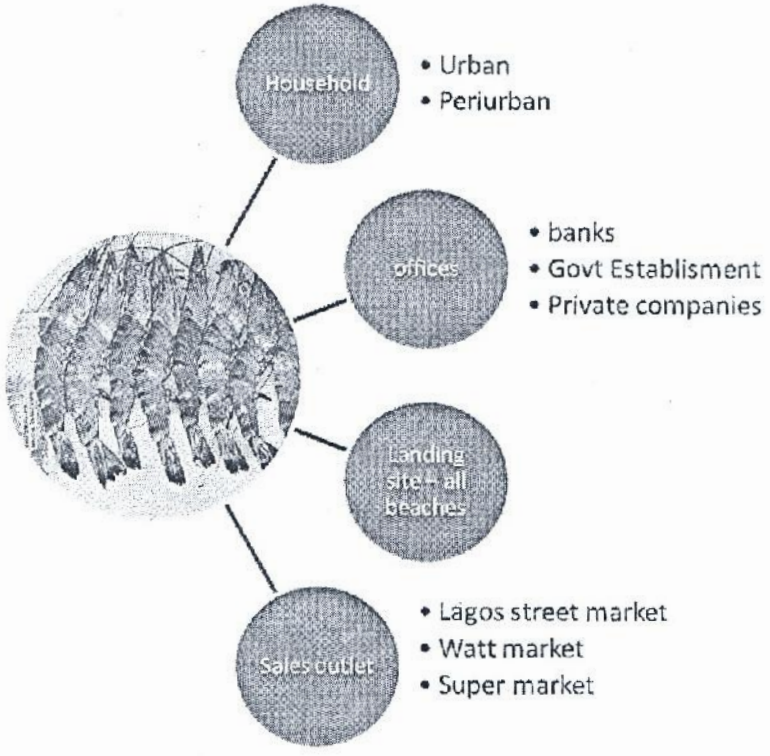



Fig 2: Stratified random sampling.

Four local government areas were chosen and visited because of the shrimp and prawn activities in the area. These were Calabar south, Calabar municipality, Akpabuyo and Bakasi (Table 1). The survey was conducted in March, 2011.

TABLE 1: AREAS OF SITE VISITATION AND QUESTIONNAIRE ADMINISTRATION.

| S/N | SAMPLING SITES | LOCATION (GPS) |
|---|---|---|
| 1 | Watt market(Calabarsouth) | N04° 57' 26.3", E08° 19' 21.1" |
| 2 | Lagos street market (Calabar south) | N04° 57' 22.9", E08° 19' 8" |
| 3 | Esuk Abitu ( Calabar south) | N04° 54' 57", E08° 19' 0.2" |
| 4 | Esuk Jebs ( Calabar south) | N04° 54' 59", E08° 18' 54.8" |
| 5 | Esuk Nsidung(Calabarsouth) | N04° 57' 05.6", E08° 18' 35.3" |
| 6 | Esuk Atansiyak (Calabar south) | N04° 56' 59.5", E08° 18' 30.3" |
| 7 | Esuk Atu (Great Qua river) (Calabar municipality) | N04° 56' 58.8", E08° 21' 31.0" |
| 8 | Esuk Mba (Akpabuyo LGA) | N04° 61' 55.0", E08° 23' 44.4" |
| 9 | Esuk Ikang (Bakasi) | N04° 47' 18.0", sE08° 31' 58.3" |

The survey was conducted using a three pronged approach :

1) Planning, logistics and status overview.
2) Field visits and interviews.
3) Report writing.

Presurvey meetings were held with different stake holders (Plate 1) in the state to determine areas of visitation ,assessment for shrimp and prawns survey plan, logistics and peculiar issues in shrimp and prawn exploitation.

**Plate 1: PRE-SURVEY MEETING( Meeting with the director of fissheries CRS during the survey).**

## RESULTS

## FISHERIES ACTIVITIES

Lot of fishing activities was witnessed around the great Kwa River and Cross River including their tributaries. Fish species observed were: *Chrysichthys nigrodigitatus* (silver catfish), Baracuda, Sole fish, Red snapper and Shiny nose. - Others include Tilapia (Asat), Catfish (Inakha) and Croacker (oniok). Shell fish include: Crab (ukong), Shrimp (Ibiaye) and Prawn (Ndek obu). The major shrimp and prawns encountered were:

*Macrobrachium vollenhovenii* ( Giant Freshwater prawn).
*Penaeus monodon* ( Black Tiger shrimp).
*Penaeus notialis* (Pink shrimp).
*Nematopalaemon hastasus* (Cray fish).
Ghost shrimp.

### Demographic information

Table 2 showed that the number of male respondents (50%) that participated in this survey was equal to the number of female respondents (50%).

**Table 2: Demographic information of respondents.**

| Gender | Frequency | Percentage | Valid percentage | Cumulative percentage |
|---|---|---|---|---|
| Male | 35 | 50 | 50 | 100 |
| Female | 35 | 50 | 50 | 100 |
| Total | 70 | 100 | 100 | |

**Age of respondents**

The age group (Fig 3) with the highest percentage (32.8%) was group 40-49 years, followed by age group 30-39 (24.2%), 20-29 (14.2%), 50-59(12.8%) and 60-70(1.4%).

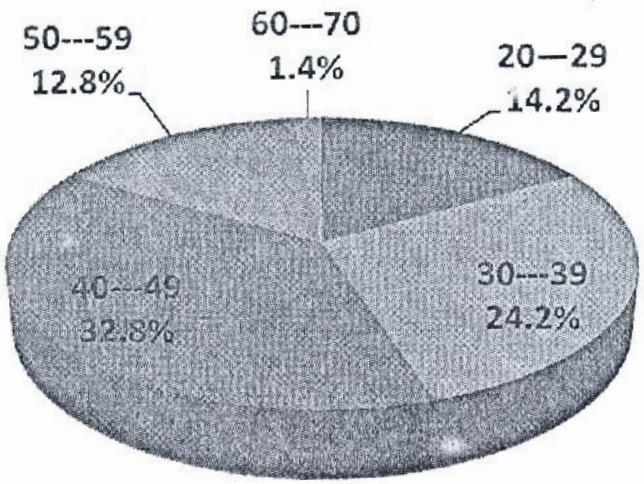



**Fig. 3: Distribution of respondents by age.**

**Educational background**

Forty percent (40%) of the respondents had tertiary education, 28.5% completed secondary education while 7.1% of the respondents did not complete secondary education. Those that completed their primary education12.3%, while 5.7 % of the respondents had college of education and technical training.

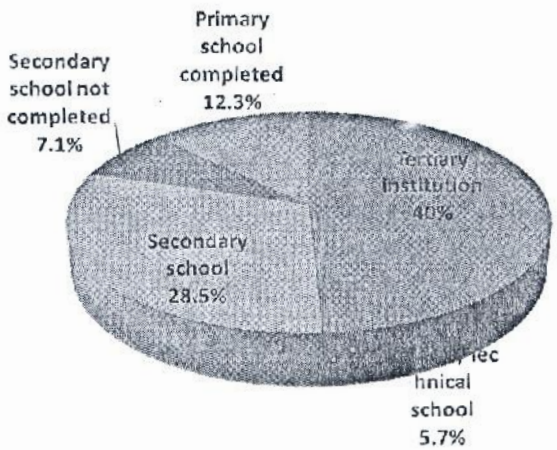



**Fig 4: Distribution of the respondents by educational background.**

## TYPES OF SPECIES CULTURED

During the survey the team sought to find out what types of shrimp and prawn species were cultured. The reply from the respondents was that various types were consumed through purchases from the beaches and the open market and other retail outlets but there was no knowledge of farming the species in the various areas visited. There were no shrimp or prawn farms at the time of visit.

## ESTABLISHMENT OF SHRIMP/PRAWN FARMS

The respondents informed the team of scientists that they have not ventured into farming of shrimps and hence could not give cost of setting up a shrimp or prawn farm. They also stated that procurement of loans was difficult for the establishment of aquaculture and other fishing activities. Majority of the respondents (87%) were highly interested in venturing into shrimp or prawn farming if the technology for propagation and the management protocols for culture were made available by the visiting team.

## CULTURE FACILITIES

At the time of this survey there were no culture facilities on ground for the propagation of shrimps and prawns in the state. Culture protocols and management practices were non existent. Information as to the types of feed, feeding regimes, stocking density, broodstock availability, post larvae production and problems encountered during culture were unavailable.

## MARKETING OF SHRIMP AND PRAWNS

The costs of shrimp/prawns cultured, be it annual production, adult size sales, income generated from exportation and any economic turn over could not be ascertained. The only costs that could be obtained were those from the sales outlets for captured shrimp and prawn as shown in table 3.

**TABLE 3: Market price for shrimp and prawn.**

| UNIT OF MEASUREMENT | WEIGHT | PRICE |
|---|---|---|
| PLATES | 60g | ₦200 |
| FROZEN PLATES | 450g | ₦1450 |
| FROZEN PLATES | 500g | ₦1650 |
| BASKETS | 600g<br>900g | ₦2000<br>₦3000 |
| KILOGRAM | 1kg | ₦4000 |
| BAGS | 600g-1kg | ₦2000-N4000 |

## TRAINING

None of the respondents interviewed had ever undergone any form of training in shrimp/prawn farming. Although the enthusiasm for learning was high as it was believed that if mastered could improve their lively hood.

## DISCUSSION

The demographic information obtained showed that an equal number of males and females were represented in the respondents with a fifty percent (50%) equity distribution. The age of the respondents from figure 1 above also showed that the age range of 20-59 which accounted for eighty four (84%) of the distribution are in the active productive age range that could be harnessed for the propagation of the species. The educational background of the respondents showed a high literacy level that would be able to assimilate the technological know how of shrimp and prawn propagation. Cross river state has a good

environment for development of shrimp or prawn farming.
The dearth of information that ensued from this survey may be attributed to the lack of technical know-how for the propagation of the species. Therefore efforts must be put in place for the dissemination and transfer of shrimp and prawn culture technology to improve the lively hood of the citizenry, alleviate poverty and provide avenues for employment opportunities.

## CONCLUSION

Shrimp and prawn fishing activities emanating from capture fisheries were high in the state although there were no farms at the time of visit. The vast water bodies in the state, availability of broodstock and the high interest of the citizens to venture into culture of the species are strong indicators of a booming shrimp/prawn aquaculture in the nearest future.

## ACKNOWLEDGEMENT

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